SOEN 390 - Software Engineering Team Design Project

Team 01 - Sprint 1

Covid Tracker

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1 - Introduction

In the ongoing event of Covid-19 pandemic which has had a significant global influence, people are currently not able to receive adequate care due to full capacity hospitalizations. Medical health platforms enable users - patients, medical physicians, health authorities, administrators, and immigration officers - to obtain immediate assistance and analytical data by allowing them to keep up to date with real-time updates from other users. Medical practitioners, health officials, and immigration agents can utilize the flag function to alert or prioritize other users. All of these features are provided by Covid Tracker, which allows patients to easily engage with their medical doctor by filling out symptom information forms on their account and receiving prompt feedback from the doctor. Health professionals can also keep up to date and informed by keeping track of verified and unconfirmed patient statistics. Moreover, patients will be able to obtain proper treatment and hospitalizations will be reduced. This document is directed towards stakeholders taking part in the project and is intended to give a brief overview and idea of what and how the project will proceed.

2 - Project Description

Covid Tracker aims to provide a means of communication and analysis between Covid-19 confirmed or unconfirmed patients, and medical doctors, health officials, and immigration officers. COVID-19 affected people are being tracked by doctors and government health experts. The system is built in a way that makes it easy for them to keep track of COVID-19 patients' present conditions and provide advice to them. It also allows COVID traceability in the sense where health officials are able to trace back and report anyone who was in contact with a positive COVID-19 patient. Covid Tracker will be available for use through mobile and web application.

By emphasizing people over procedures, agile software development strategies solve the difficulty of an uncertain environment. These techniques might be seen as a reaction to plan-based or traditional methods that emphasized a rationalized engineering-based approach in which concerns are addressed in depth.

In this project, the Scrum Agile Methodology will be utilized. Scrum is a system development methodology based on the industrial control theory concept. Technical and environmental variables such as changes in technology, time periods, and demands are only a few of the technical and environmental considerations that go into system development. It doesn't go into detail on software development techniques, but it does explain how team members should collaborate. The team will follow a fixed 3-week iteration with scrum meetings to update each other with each individual’s progress, what each individual will be working on, and whether there are any issues or blockers. This Agile methodology

seems to be perfect to manage the team process and development for this project as it will help the team stay prepared in advance and manage their time wisely.

Story points are needed to gauge how much we can plan in current sprint or incoming ones which make it easier to plan in advance tickets, have visibility over what's left to accomplish and when would the next potential be achieved. building our roadmap while providing visibility over progress.

Story Points : Time Scale

Story Points	Time
0.5	1 hour
1	4 hour
2	1 day
3	2 days
5	3.5 days
8	5 days
13	2 weeks
20	3 weeks
40	1 month
100	3 months

The sprint schedule will be as follows:

Sprint	Date
1	12/01/2022 - 02/02/2022
2	03/02/2022 - 23/02/2022
3	24/02/2022 - 16/03/2022
4	17/03/2022 - 06/04/2022

3 - Requirements

The following requirements were elicited from the product owner and have been turned into user stories approved by the product owner. **41 user stories** have been elicited for a total of **80 user story points**.

US-1	**As a patient, I have to update my status everyday before 11:59 PM so that my doctor has correct and accurate information**
USP	3
Priority	2 (High)
Description	Send a reminder to patients to update status before 11:59 PM → Patients will use same form to update once a day

US-2	**As Health official, I have to send a reminder to patients everyday to update their status to receive correct and accurate data**
USP	3
Priority	3 (Normal)
Description	Send a reminder to patients to update status before 11:59 PM

US-3	**As doctor, I would like to define a list of symptoms for the patient to fill out**
USP	2
Priority	2 (High)
Description	The option will be provided in the doctor's dashboard to request additional symptoms from the patient to fill

US-4	**As a patient, I would like to provide details about my symptoms to better describe my symptoms for the doctor.**
USP	2
Priority	2 (High)
Description	A text box for patient to elaborate or provide additional information

US-5	**As a patient, I would like to edit my status in case of a mistake so that I do not give the doctor false information**
USP	2
Priority	2 (High)
Description	Ability to edit profile information

US-6	**As a patient, I would like to re-update my symptoms in case of change of symptoms so that the doctor can monitor my symptoms**
USP	2
Priority	2 (High)
Description	Ability to edit profile information

US-7	**As a doctor, I would like to receive an update concerning my patients' status so I can better monitor them**
USP	2
Priority	3 (Normal)
Description	Receive notifications once (flagged) patient update status

US-8	**As a health official, I would like to be able to trace people in contact with COVID-19 patient so that I can warn people who could possibly be infected**
USP	2
Priority	2 (High)
Description	To be able to see a list of people who have been in contact with others.

US-9	**As a health official, I would like to be able to contact people who were in contact with COVID-19 patient through email, phone number and home address so that I can warn people who are possibly infected**
USP	2
Priority	2 (High)
Description	Automatic email will be used to contact those who were in contact with positive COVID-19

US-10	**As a patient, I would like to be able to report people I was in contact with to warn them of a possible infection**
USP	2
Priority	2 (High)
Description	Patient will submit form : ● Area (location) ● With who? ● Provide additional info if able to (People they know e.g, family members, phone numbers etc..)

US-11	**As a doctor, I would like to flag certain COVID-19 patients to prioritize their updates**
USP	2
Priority	2 (High)
Description	Doctor would be able to flag patients: - High - Normal - Low

US-12	**As a health official, I would like to flag certain COVID-19 patients to prioritize their updates**

USP	0.5
Priority	2 (High)
Description	Health official would be able to flag patients: - High - Normal - Low

US-13	**As an immigration officer, I would like to flag certain COVID-19 patients to prioritize their updates**
USP	0.5
Priority	2 (High)
Description	Health official would be able to flag patients: - High - Normal - Low

US-14	**As a health official, I would like to view all the user's information to get accurate data**
USP	2
Priority	2 (High)
Description	Health Official has permission to view patient profile information

US-15	**As an immigration officer, I would like to only view the COVID-19 status of a specific user to analyze for travel purposes**
USP	2
Priority	2 (High)
Description	Permission to only be able to view user status

US-16	**As a doctor, I would like to view all the user's information to diagnose properly without missing any information**
USP	1
Priority	2 (High)
Description	Doctor able to view all patients' information

US-17	**As a health official, I would like to monitor the status of confirmed patients to get accurate data**
USP	2
Priority	2 (High)
Description	Ability to view certain patients’ status

US-18	**As a health official, I would like to monitor the symptoms of confirmed patients to get accurate data**

USP	2
Priority	2 (High)
Description	Ability to view certain patients' symptoms → Focus on filtering confirmed patients

US-19	**As a medical doctor, I would like to monitor the status of confirmed patients to better follow up**
USP	1
Priority	2 (High)
Description	Ability to view certain patient's status

US-20	**As a medical doctor, I would like to monitor the symptoms of confirmed patients to better follow up**
USP	1
Priority	2 (High)
Description	Ability to view certain patients' symptoms

US-21	**As a health official, I would like to monitor the status of unconfirmed patients identified through contact tracing to accurately collect data**
USP	1

Priority	2 (High)
Description	Ability to view certain patients' status (unconfirmed patients)

US-22	**As a health official, I would like to monitor the symptoms of unconfirmed patients identified through contact tracing to accurately collect data**
USP	1
Priority	2 (High)
Description	Ability to view certain patients' symptoms → Focus on filtering unconfirmed patients

US-23	**As a medical doctor, I would like to monitor the status of unconfirmed patients identified through contact tracing to immediately help them in case of any change**
USP	1
Priority	2 (High)
Description	Ability to view certain patients' status

US-24	**As a medical doctor, I would like to monitor the symptoms of unconfirmed patients identified through contact tracing to immediately help them in case of any change**
USP	1

Priority	2 (High)
Description	Ability to view certain patients' symptoms → Focus on filtering unconfirmed patients

US-25	**As a medical doctor, I would like to arrange an appointment with a COVID-19 patient to diagnose**
USP	3
Priority	2 (High)
Description	Calendar based arrangement

US-26	**As a patient, I would like to receive notifications by Email once a medical doctor arranges an appointment with me to acknowledge it**
USP	2
Priority	3 (Normal)
Description	Automatic Email

US-27	**As a patient, I would like to receive reminders by Email regarding my appointment to not miss any appointments**
USP	2
Priority	3 (Normal)

Description	Automatic Emails

US-28	**As a medical doctor, I would like to know which patient's updates I have reviewed to avoid any mix ups**
USP	2
Priority	3 (Normal)
Description	Doctor will have the option to mark patient row as "Read" or "Unread"

US-29	**As a health official, I would like to monitor the symptoms of confirmed patients to get accurate data**
USP	2
Priority	3 (Normal)
Description	Doctor will have the option to mark patient row as "Read" or "Unread"

US-30	**As a medical doctor, I would like to open a non-reviewed patient case and mark it as reviewed after 10 seconds to avoid opening the same case**
USP	2
Priority	3 (Normal)

Description	Doctor will have the option to mark patient row as "Read" or "Unread"

US-31	**As a medical doctor, I would like to open a reviewed patient case and mark it as un-reviewed to review it later on**
USP	2
Priority	3 (Normal)
Description	Doctor will have the option to mark patient row as "Read" or "Unread"

US-32	**As a patient, I would like to contact my doctor using an email to easily communicate**
USP	3
Priority	2 (High)
Description	• Messaging System • The patient is assigned to a doctor, it will automatically send the doctor an email without exposing the doctor's contact information

US-33	**As a patient, I would like to be able to flag my doctor if my email is urgent or an emergency to be prioritized**
USP	2
Priority	2 (High)

Description	• Messaging System • Form --> Patient will choose option to flag message as urgent This means that doctor can filter chats by urgency

US-34	**As a doctor, I would like to be able to communicate with my patients with messaging chat system**
USP	2
Priority	2 (High)
Description	• Messaging System • The patient is assigned to a doctor, it will automatically send the doctor an email without exposing the doctor's contact information

US-35	**As a doctor, I would like to see if the message / email is flagged as urgent/emergency to prioritize the patient**
USP	2
Priority	3 (Normal)
Description	Receive notifications or sort messages by urgency

US-36	**As a doctor I would like to see all my patients status using a dashboard to access easily**
USP	2
Priority	2 (High)

Description	Ability view all patients status from dashboard (a table to show all patients status)

US-37	**As a doctor I would like to see the dashboard in a form of graph or form to read easily**
USP	2
Priority	3 (Normal)
Description	Graph representation of data

~~US-38~~	~~**As a doctor I would like to see my patients status daily to follow up on them**~~
~~USP~~	~~2~~
~~Priority~~	~~2 (High)~~
~~Description~~	Duplication

US-38	**As a doctor I would like to see when the last time a patient has made a change to compare his status with the previous one**
USP	2
Priority	2 (High)
Description	Log patient's status change history

US-39	**As an admin I would like to see the number of patients assigned to each doctor to not overload any doctor while some others do not have as many patients.**
USP	2

Priority	2 (High)
Description	A list of doctors showing how many patients are assigned

US-40	**As an admin, I would like to un-assign patient to a doctor to be able to clear the doctor's list if needed**
USP	2
Priority	2 (High)
Description	Unassign doctors from patients permission

US-41	**As an admin, I would like to monitor the patients and doctors to assign doctors to patients**
USP	2
Priority	2 (High)
Description	View all doctors and patients

For Sprint 1, our goal was to extract all the user stories, currently none of the user stories were completed in this sprint. Some are set to be completed in Sprint 2, which is why currently there is no backlog written for sprint 1 as it will be the same amount of user stories listed above.

4 - Release Planning

4.1 - Sprint 1 Summary

This sprint focused on delivering the UI design and software architectural design. During the sprint, the requirements of the project were extracted as user stories. The main goal was making sure that the project idea was well and clearly understood. The team believes that this will prevent most errors during upcoming sprints which is why it was important to focus on the requirements. Following the elicitation process, the team realized that in order to start working on the extracted user stories in sprint 2 while maintaining schedule, it was essential to construct the skeletal frontend code and database design. The user stories were then divided across the sprints. The starting point stories, e.g: patients table for doctor, are stories that the team aimed to focus on for Sprint 2. All user stories that require small features to be added, were pushed beyond Sprint 2.

Story ID	Story	USP	Status
US-42	UI/UX Design	8	**DONE**
US-43	Product Elicitation	5	**DONE**
US-44	Testing Plans & Setup	3	**DONE**
US-45	Software Architecture Design	5	**DONE**
US-46	Risk Management Assessment	5	**DONE**
US-47	Running Prototype (Skeleton)	8	**DONE**
US-48	Login/Register Development	5	**DONE**
Total		**39**	**39**

Project velocity after 1 sprint: 39

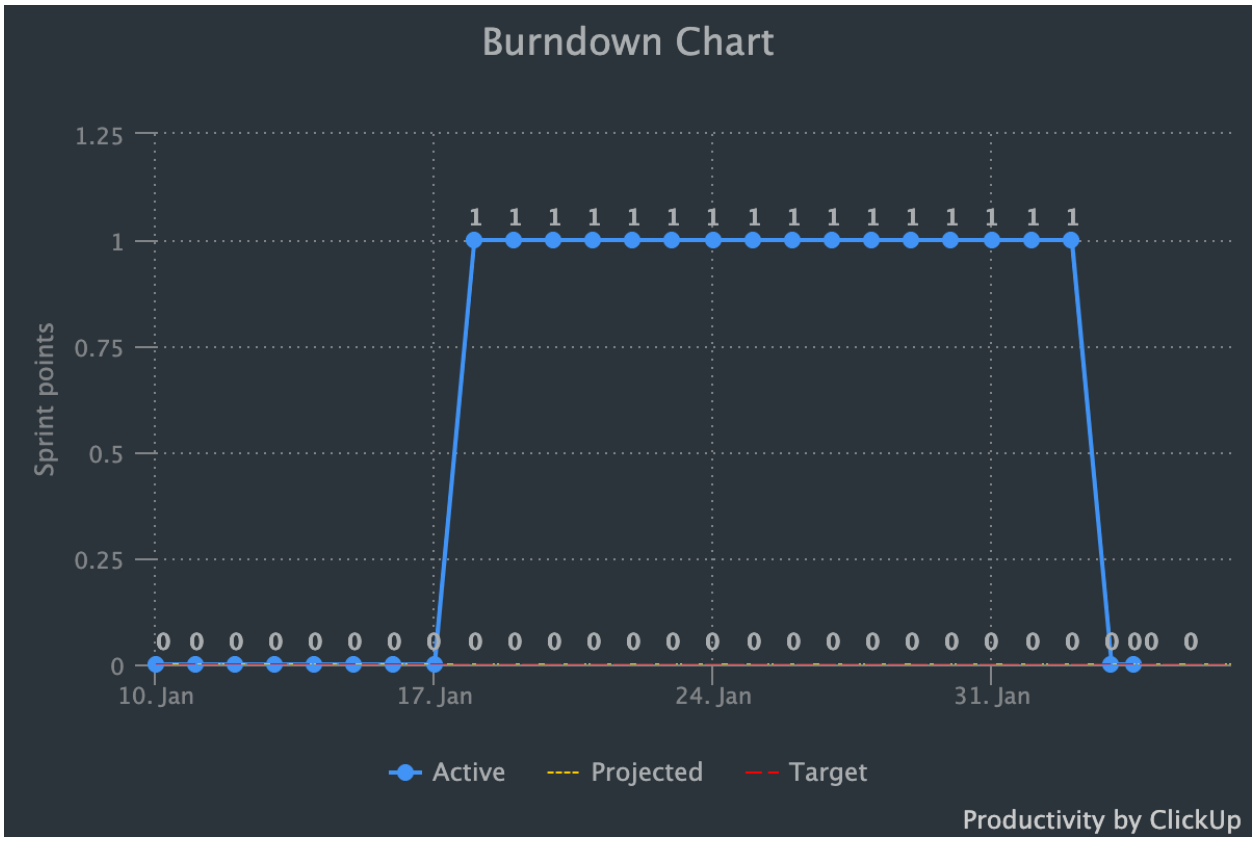


Figure 1: Burndown Chart

Sprint 1 Retrospective

The goal that was set from the start for Sprint 1 was to achieve and focus on completing the User Interface (UI) design. Currently, the UI design has been completed, the skeletons for the UI have been developed, and the login/registration screens were also developed. The software architecture was designed along with the database including the setup. The team is prepared to initiate with Sprint 2.

Keep doing: The team is impressed and satisfied with the work environment and team work as well as the organization that the team maintains with code, folders, documents, tasks, schedules, meetings, and so on.

Start doing

During the Sprint, it has been realized that it is essential to make the effort to request feedback and review on completed work. It has been agreed that the team will begin requesting work review after completing every task.

Stop doing

Arguments over small details are unnecessary as agreed upon with the team. It is essential that the focus and vision is maintained across the whole team.

Do more of

Updating ClickUp tasks, and leaving comments and feedback when needed.

Do less of

Nothing is needed to be done less of.

4.2 - Sprint 2 Planning

This sprint will focus on delivering the patient profile views for doctor, patient, immigration officer, health official, and administration. [Talk a bit more about what will happen this sprint. What problems you might face. What stories you have to catch up on from last sprint, etc…].

Story ID	Story	USP	Status
US-5	As a patient, I would like to edit my status in case of a mistake so that I do not give the doctor false information	2	
US-11	As a doctor, I would like to flag certain COVID-19 patients to prioritize their updates	2	
US-12	As a health official, I would like to flag certain COVID-19 patients to prioritize their updates	0.5	
US-13	As an immigration officer, I would like to flag certain COVID-19 patients to prioritize their updates	0.5	

US-14	As a health official, I would like to view all the user's information to get accurate data	2	
US-15	As an immigration officer, I would like to only view the COVID-19 status of a specific user to analyze for travel purposes	2	
US-16	As a doctor, I would like to view all the user's information to diagnose properly without missing any information	1	
US-17	As a health official, I would like to monitor the status of confirmed patients to get accurate data	2	
US-18	As a health official, I would like to monitor the symptoms of confirmed patients to get accurate data	2	
US-19	As a medical doctor, I would like to monitor the status of confirmed patients to better follow up	1	
US-20	As a medical doctor, I would like to monitor the symptoms of confirmed patients to better follow up	1	
US-21	As a health official, I would like to monitor	2	

	the status of unconfirmed patients identified through contact tracing to accurately collect data		
US-22	As a health official, I would like to monitor the symptoms of unconfirmed patients identified through contact tracing to accurately collect data	1	
US-23	As a medical doctor, I would like to monitor the status of unconfirmed patients identified through contact tracing to immediately help them in case of any change	1	
US-24	As a medical doctor, I would like to monitor the symptoms of unconfirmed patients identified through contact tracing to immediately help them in case of any change	1	
US-36	As a doctor I would like to see all my patients status using a dashboard to access easily	2	
US-37	As a doctor I would like to see the dashboard in a form of graph or form to read easily	2	
US-41	As an admin, I would like to monitor the patients and doctors to	2	

	assign doctors to patients		
Total		**27**	

5 - Architecture

5.1 - Introduction

5.1.1 - Vision

At the start of 2020, many countries around the world were severely impacted by COVID-19. Many health organization systems collapsed due to the influx of patients going to hospitals to get better. The following software architecture was designed to allow official authorities and users to be able to input their current state of Covid19 and allow medical doctors and health officials to give advice to these patients.

5.1.2 - Scope

Due to the short of time respectively with the number of the human resources available for this project, the scope defined to this project is limited to these constraints:

- The users who will benefit from this application are the resident found in the province of Quebec
- International travelers are entering the province through air travel

5.2 - Diagrams

5.2.1 - Component Diagram

The Component Diagram shows the main components/packages that will be dealt with in the building process of this application. As it has been shown here the main component is the web application component that can be considered the main component to provide two types of communications: internal communication between all the small packages inside the applications; for instance, the different user's roles and the abstraction and isolation between them. As well as the external communication with all the external components like DBMS that by itself deal with the database, and the I/O from the user side using the portal to web application, an example of the portal is the user's browser.

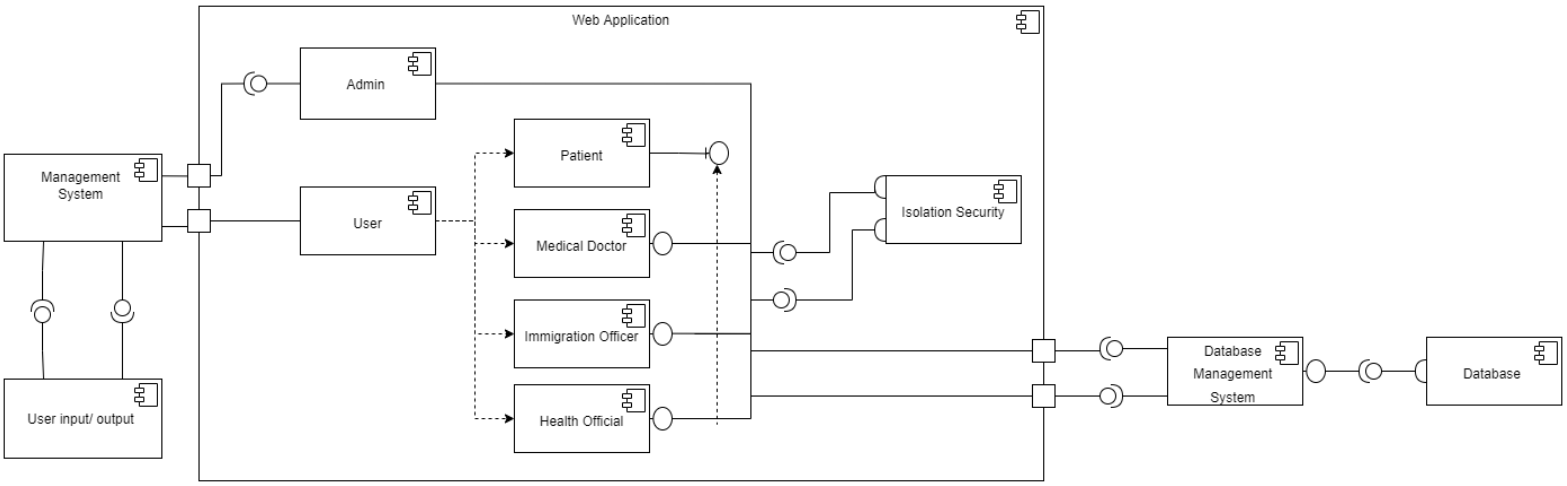


Figure 2: Component Diagram

5.2.2 - Domain Diagram

The Domain Diagram below states the 5 main users of the application which are admin, patient, medical doctors, health officials and immigration officer. Admin is mainly responsible for dealing with patients and medical doctors as well as assigning a doctor to each confirmed patient. Immiragtion officers and health officials are mainly responsible for following up on the status of the patients. The 5 users mentioned above will have different visibilities in the app, for example certain information will be concealed. The application is used by 2 types of patients, confirmed and non-confirmed patients. Based on the patient the status will differ.

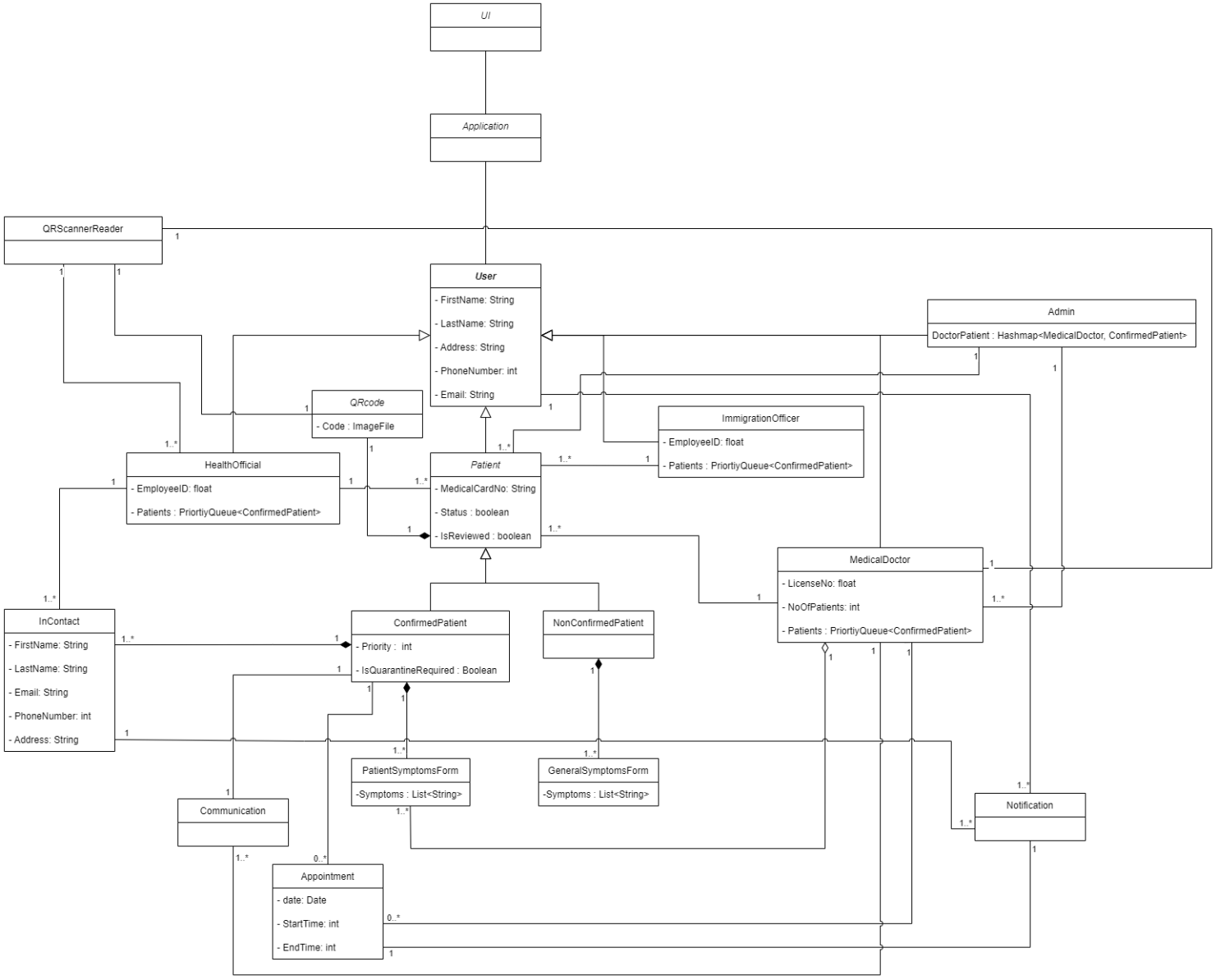


Figure 3: Domain Diagram

6 - Risk Management

Risk Category	ID	Risk	Risk Level L/M/H	Likelihood of Event	Risk Factor	Risk Owner	Resolved in Sprint	Mitigation Strategy
Project Size	1	Person Hours	**H:** 260 person hours (15hrs per week) 17.381 weeks in 4 months	**Likely** to go over the set time	0.8	Rayan		Assigned Project Champion, assigned Scrum Master, comprehensive project management approach and communications plan
	2	Estimated Project Schedule	**H:** Over 4 months	**Unlikely** to go over 4 months	0.2			Created a comprehensive project timeline with frequent baseline reviews, supported by Grantt Chart and ClickUp App; Adapting Agile development with standups
	3	Team Size at Peak	**M:** 8 members	**Unlikely** to change members	0.132		In Sprint 1	Comprehensive communications plan, frequent meetings, tight project management oversight, small team
	4	Number of Interfaces to Existing Systems Affected	**M:** 2	**Unlikely** to have any interface changes	0.132			Develop interface control document immediately for the app and website
Project Definition	5	Narrow Knowledge Level of Users	**H:** Knowledgeable of user area only	**Unlikely** not to have knowledge of the users	0.2			Assigned Project Champion(s) to assess global implications, Users: admins, health officials, immigration officers, medical doctors, and patients
	6	Available documentation clouds establishment of baseline	**M:** Documentations of the start-up and system-to-be.	**Unlikely** not to have the required documentations.	0.132			Balance of information to be gathered by the consultant, plan to understand and design the System-to-be at the start of the project
	7	Project Scope Creep	**M:** Scope well defined, subject to revision	**Unlikely** to change scope	0.132		In Sprint 1, but should be considered for every sprint	Course Plan well defined, Scope/feature initially defined in project plan, reviewed weekly during sprint meeting
	8	Consultant Project Deliverables	**L:** Well defined	**Unlikely** for deliverables to be unclear	0.066			Included in project plan, feature and implementation clear

		unclear						
	9	Stakeholder Project Deliverables	**H:** Well Defined	**Somewhat-Unlikely** for the course plan to change	0.4	Lujain		Included in the project course plan, subject to amendment
	10	Cost Estimates Unrealistic	**H:** Well Defined, no charge for a small project	**Likely** to change the cost when going live on production	0.8	Lujain		Included in project plan, project free of charge unless when releasing a production version
	11	Timeline Estimates Unrealistic	**H:** Timeline assumes no derailment	**Somewhat-Unlikely** to derail from timeline assumed	0.4	Lujain		Timeline reviewed bi-weekly by three groups (Project Champion, Scrum Master, Stakeholders) to prevent undetected timeline departures
	12	Number of Team Members Unknowledgeable of Business	**M:** Team well versed in business operations for this specific feature	**Somewhat-Unlikely**	0.264			Project Champion and consultant to identify knowledge gaps and provide training, as necessary
Project Leadership	13	Absence of Commitment Level/Attitude of Management	**L:** Understands value & supports project	**Unlikely** to have any absence of commitment	0.066			Frequently seek feedback to ensure continued support
	14	Absence of Commitment Level/Attitude of Users	**M:** Understands value & supports project	**Somewhat-Unlikely** to have any absence of commitment	0.264			Frequently seek feedback to ensure continued support, and keeping the system accurate
	15	Absence of Mid-Management Commitment	**L:** Most understand value & support project	**Unlikely** to have any absence of commitment	0.066			Frequently seek feedback to ensure continued support
Project Staffing	16	Project Team Availability	**H:** Team has a dedicated weekly remote meetings to work on all the assigned work	**Somewhat-Unlikely** to change team availability	0.4		In Sprint 1, but should be kept an eye on	Continuous review of project work that has been done, identify any impacts caused by unavailability. If necessary, increase commitment by participants to more meetings/tasks. Maintain a constant weekly meeting to sum up and go over the work of every member. The use of slack and discord to coordinate and set up meeting or ask question.
	17	Physical Location of Team prevents effective	**L:** Team works remotely	**Unlikely** to decrease management of the team	0.066			Use of Intranet project website, comprehensive Communications Plan, as well as Google Docs, Slack, Discord, and GitHub for

		management						communication
	18	Project Team's Shared Work Experience creates poor working relationship	**H:** Most members have worked together before	**Unlikely**	0.2			Comprehensive Communications Plan, had previous projects together
	19	Weak User Participation on Project Team	**M:** Users enter themselves in the beta app survey participation	**Somewhat-Likely**	0.396			User Group Participants coordinated by the team, User willing to test with the beta platform
Project Management	20	Procurement Methodology Used foreign to team	**L:** Procurement Methodology not fully familiar to the team.	**Unlikely**	0.066			Project not awaiting for any foreign procurement methodology
	21	Change Management Procedures undefined	**L:** Well-defined	**Unlikely**	0.066			The team is familiar with Scrum methodology and Agile procedures
	22	Quality Management Procedures unclear	**L:** Well-defined and accepted	**Unlikely**	0.066			Well defined and Frequent unit testing
	23	Losing all project data from source code to documentations	**H:** Adapting online storage solutions	**Unlikely**	0.2		In Sprint 1	Usage of online storages like Google Drive for documentation, GitHub for source code, and ClickUp for tasks and progress
	24	Conflicts in code when working in a team	**H:** causes loss of progress and inability to undo the changes	**Unlikely**	0.2		In Sprint 1	We are adapting GitHub with correct branch names linked to a specific task in ClickUp, and create a Pull Request. Keeping these Pull Requests as short as possible. Assigned team members to review the PRs in the front-end and server
Software Vendor	25	Number of Times Team Has Done Prior Work with Vendor Creates Foreign Relationship	**H:** Never	**Certainty**	1	Kerolos		A comprehensive vendor evaluation and selection process (incorporated into Project Plan) will be employed to predict and define the relationship between the department and the vendor
	26	Team's Lack of Knowledge	**M:** Conceptual understanding	**Somewhat-Likely**	0.396	Rayan		Comprehensive vendor evaluation and selection process incorporated

		of Package						into Project Plan will assist the team in better understanding the package offering(s)
	27	Poor Functional Match of Package to Initial System Requirements	**L:** Minimal customization required. Just implementation is required.	**Unlikely**	0.066			Although a package has not yet been selected, the Consultant has compared the initial requirements with available functionality and determined that a functional match to the initial requirements is very likely. Vendor selection will be based, in part, on how well the proposed application matches defined functional specifications.
	28	Team's Involvement in Package Selection Impacts Success of Implementation	**L:** High involvement in selection	**Unlikely**	0.066			Comprehensive vendor evaluation and selection process incorporated into Project Plan

The above table shows the many risks that can happen to this project. The risks are logged in the following link: Risk Management Log. For each risk, the risk level, likelihood, risk factor, risk owner, and mitigation strategy are well defined. The risk factor is calculated based on the risk level and likelihood based on the following:

Risk Level		**Likelihood of Event**	
As Text	**As Percentage**	**As Text**	**As Percentage**
L	0.33	Unlikely	0.2
M	0.66	Somewhat-Unlikely	0.4
H	1	Somewhat-Likely	0.6
		Likely	0.8
		Certainty	1

Starting a new project introduces many risks. These risks can vary from team management to product release risks. This document shows the risks that were established during the start of the project. During sprint 1, some of those risks are tackled, but most of them should be monitored carefully even after sprint 1.

7 - User Interface Design

We chose to create all of the user interface mockups for all of the user stories. When we implement those user stories in the coming sprints, we are expecting to see some UI modifications. Our UI team used tools such as Figma to generate the UI mockup and prototype so that they could begin implementing the primary component.

The login and registration pages are the most essential mockups because they will be implemented in the first sprint, here is an example.

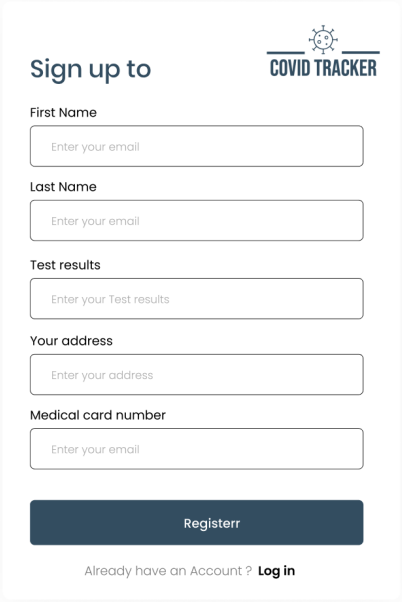


Figure 4: Register Screen

The skeleton of our dashboard is the second crucial component of our programme. This skeleton will be used for all of our users,(patient, doctor, health officials and immigration officer) and the dashboard will display different UI elements and information depending on who is signed in. Here is the skeleton.

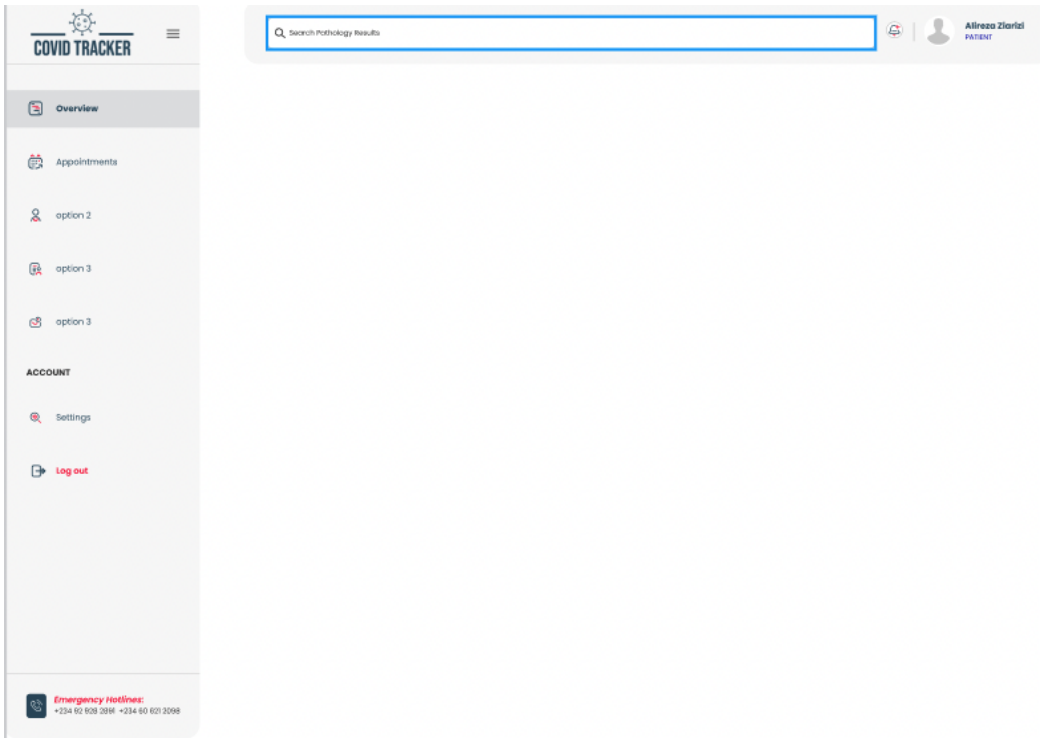


Figure 5: Skeleton Dashboard

Because we've already completed all of the UI mockups for all of the user stories, I encourage you to take a look at our Figma prototype.

One thing is certain: all of those UI elements are subject to modification, and we'll update the following document to know which ones we decide to change in the next sprint.

8 - Testing Plan and Report

For the first sprint, we've completed setting up the skeleton of the testing strategy we initially had planned. For each type of testing, the project can be separated into two parts, frontend and backend. Note that a GitHub workflow is set up for each end for Continuous Integration. Every Pull Request/Merge to the master branch will trigger the GitHub workflow and run the tests as one of the steps to avoid regressions bugs.

8.1 - Unit Testing

Frontend:

We've combined two tools to our frontend testing plan.

- Jasmine is a JavaScript based framework that provides an easy to read syntax and lets us test our Ionic application. For each created file, there will be a corresponding `.spec` file to test the functionalities of each unit/component.
- Karma is the task runner for our tests. It uses a configuration file in order to set the startup file, the reporters, the testing framework, the browser among other things. This tool takes care of displaying the results, saving us the time of writing html files for the results.

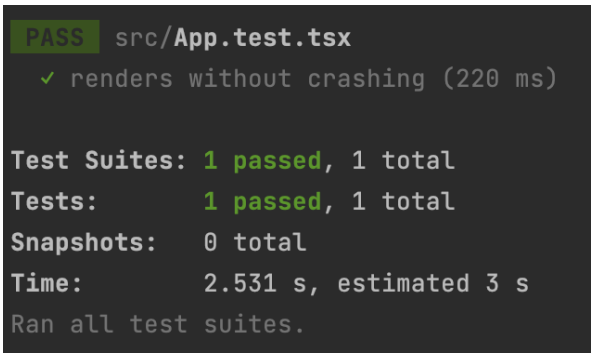


Figure 6: Frontend Test

Backend:

- Jest is a JavaScript testing framework that has an easy to read syntax similar to jasmine. Similarly, for each file we'll have a `.spec` file containing the test functions.

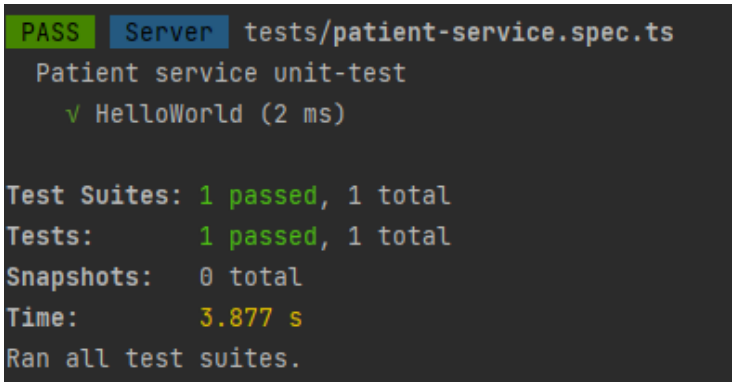
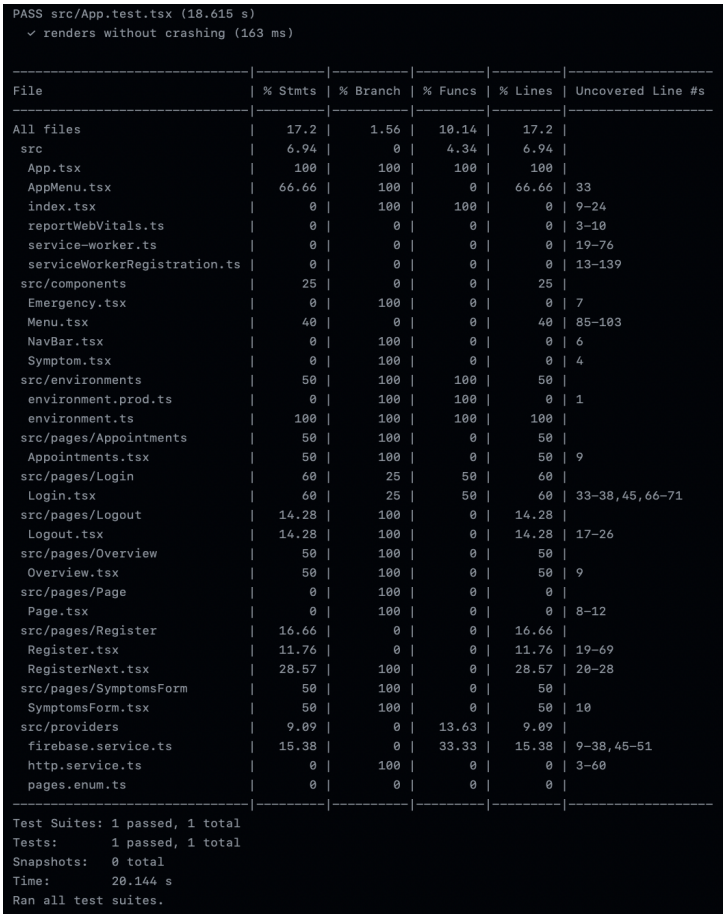


Figure 7: Back-end Test

8.2 - Test code coverage

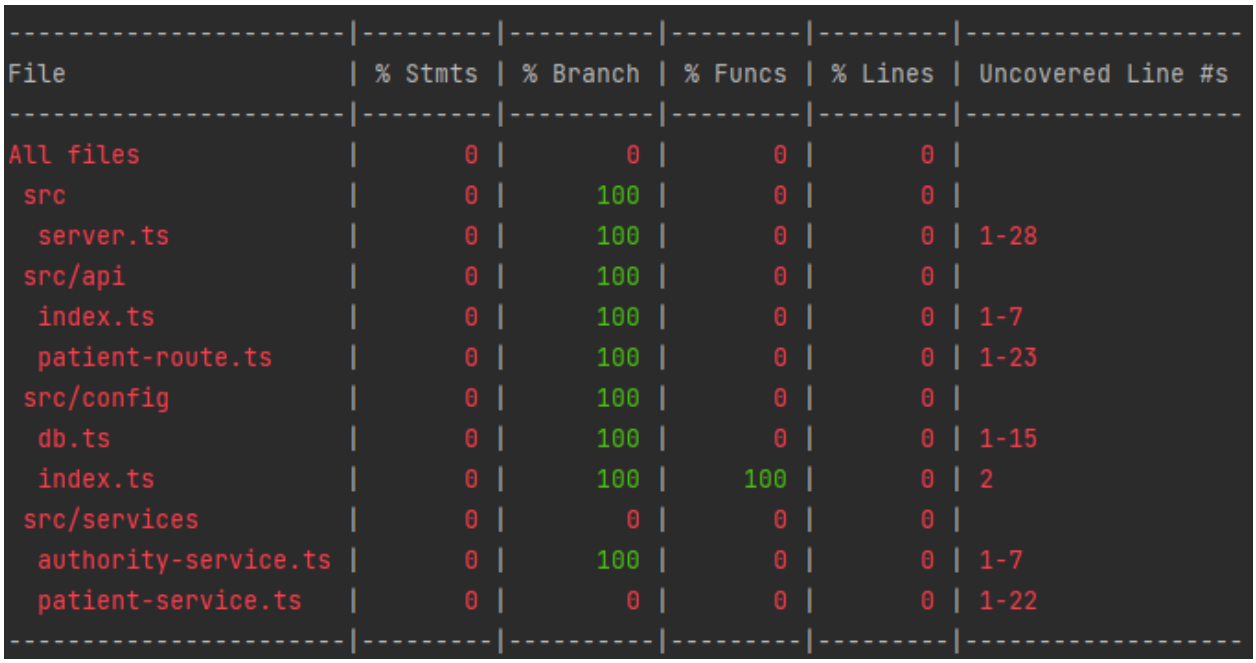
Frontend:

The frontend coverage is generated by `npm run test -- --coverage` which is managed by jasmine. The report is displayed on the terminal covering Statements, Branch, Functions, and Lines. The screenshot demonstrates the report covering all files in the repository. Note that the project is in the setup stage so there aren't any functions in the files yet to test. A firebase mock is done.



Backend:

For backend test coverage, we've configured Jest to generate a coverage report. The report is displayed on the terminal covering Statements, Branch, Functions, and Lines. The screenshot demonstrates the report covering all files in the repository. Note that the project is in the setup stage so there aren't any functions in the files yet to test.



File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	0	0	0	0	
src	0	100	0	0	
server.ts	0	100	0	0	1-28
src/api	0	100	0	0	
index.ts	0	100	0	0	1-7
patient-route.ts	0	100	0	0	1-23
src/config	0	100	0	0	
db.ts	0	100	0	0	1-15
index.ts	0	100	100	0	2
src/services	0	0	0	0	
authority-service.ts	0	100	0	0	1-7
patient-service.ts	0	0	0	0	1-22

Figure 9: Backend Test

8.3 - Acceptance Testing

AT-1	**US-48 - As a user I want to register/login**
Acceptance Criteria	Given that I am on the login page, and that I input my email, and that I input my password, and that I clicked LOGIN, I will be redirected to home page
Result	**PASS**

8.4 - System Tests

We've created a separate repo to conduct integration tests and system tests. The framework is Cucumber. It supports Behavior Driven Development (BDD). It enables defining scenarios and test cases. It also helps visualize the results of the tests.

Since the project is in the setup phase, no system test has been written yet. As we roll out features, we will write system tests for features.

9 - Defect Tracking and Report

The following table shows our Defect tracking and report system that will be followed during all sprints. Each defect or bug is identified by a certain id created by Clickup that we then use to connect to the bug's branch on github.

The standard naming convention for naming branches, commits, and pull requests is as follows.

9.1 - Branches

Branches should be named with the following template `[Task-id]_short_description`

An example of this is for creating a branch to update the readme file `10_add_readme_info`

The task id is the number associated with the ticket / issue on the ticket page. This can either be found in the url or in the ticket e.g, #1wp1m3w

9.2 - Pull Requests

This is referring to the pull request title which should describe in short what the PR is doing as well as including the task id. An example is `#1wp1m3w new api endpoint for patients checking in`

In the body or description of the pull request also include the key phrase close [ticket id] e.g, `close #1wp1m3w` this will link the pull request to the issue and automatically update the task when the pr is merged.

By following this technique, it's easier to track a defect and work on it until it's resolved, it also make it easier to retrieve any defect made for code review

Defect ID	Description	Discovered	Resolved	Status
CU-1z5wn93	Search Bar is not 100% responsive .	Sprint 1		**OPEN**
CU-1z5wn9j	Symptom form not user friendly in pixel minimum than 200px	Sprint 1		**OPEN**
CU-1z5wn9v	Register flow is buggy	Sprint 1	Sprint 1	**CLOSED**

10 - Quality Measurements

Many code metrics can be used to measure quality however since not much code has been written for sprint 1, the defect metric will be used. A defect is an error in coding that causes incorrect or unexpected results which do not meet actual requirements. The prototypes designed in Figma meet the requirements of the customer, however when the code is written there were a few defects that occurred. The design of the application did not match a few of the pages found in the figma prototypes. These defects can be resolved by testing the code and changing the code. The table below will also include the metrics that will be used in future sprints.

	Sprint 1	**Sprint 2**	**Sprint 3**	**Sprint 4**	**Sprint 5**
LOC's	1813				
Fan in/out					
Number Of comments	167				
Error discovery rate	0				
Error fix rate	0				